



E-Vision 2002: Shaping our Future by Reducing Energy Intensity in the U.S. Economy

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Issues

- ◆ Complex system with lack of systems perspective
- ◆ Energy is only, intermittently, a big deal
- ◆ “Rube Goldberg” approach to energy policy
- ◆ Market is unable to address all societally or politically acceptable externalities
- ◆ New technologies do not address Joe Bagadonitz needs



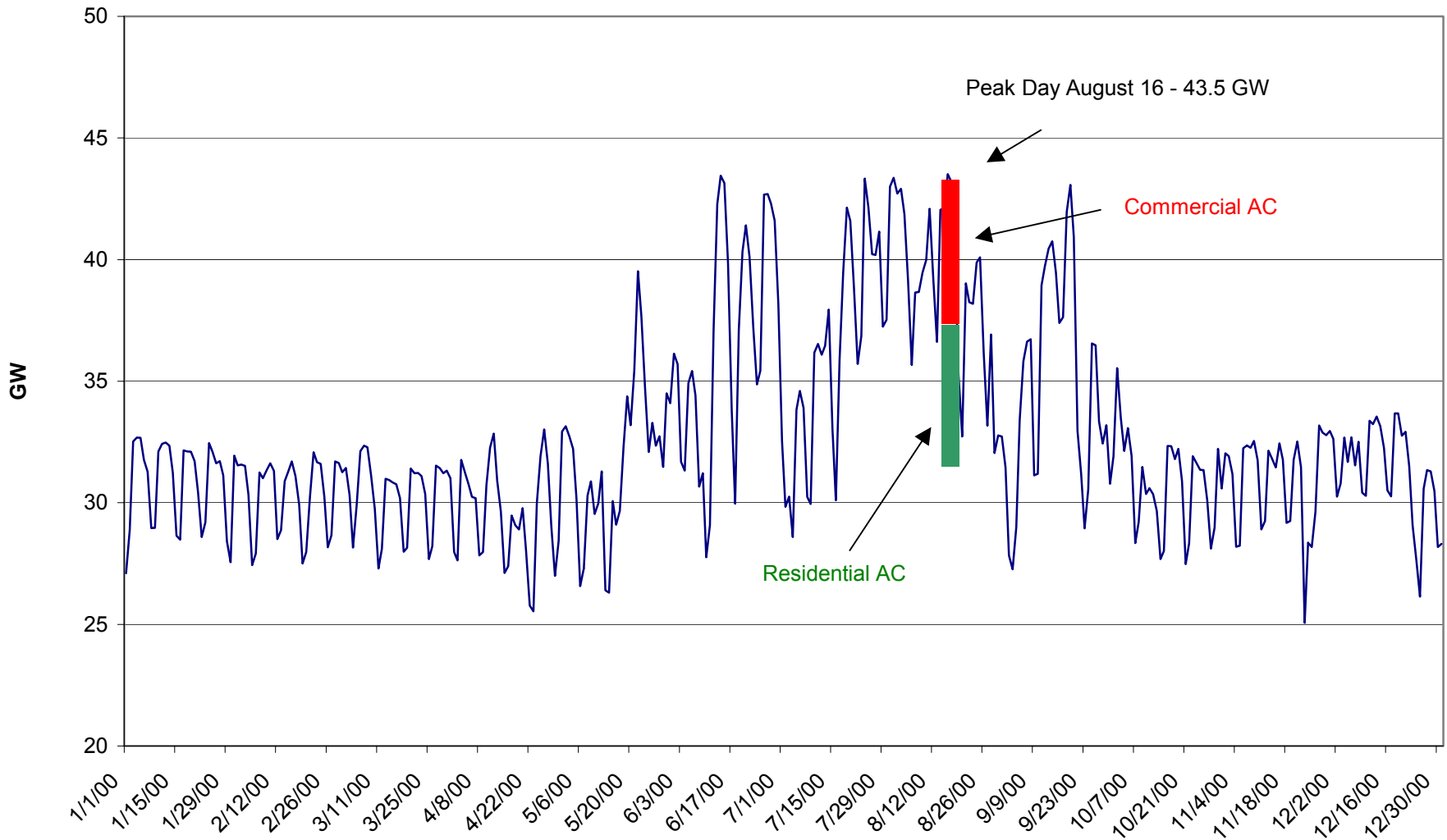
Externalities (Attributes)

- ◆ Environmental benefits: Resource development, emissions, GHG
- ◆ Systems benefits: Transmission congestion, infrastructure interdependencies
- ◆ Reduction of defense and security costs
- ◆ Cost savings: Life cycle perspective, resource availability



CAL ISO Daily Peak Loads

January 1, 2000 - December 31, 2000





Technologies Are Out There

- ◆ Proven feasibility, but up front costs a problem
- ◆ They work, but do they give the user a warm, cozy feeling (tech wonks vs. Joe B)
- ◆ Must make improvements to take advantage of overall systems benefits
 - ◆ Enabling “smart” technologies
 - ◆ Beneficial tech linkages (EE with DER)
 - ◆ Address grid impact issues



What We Can Recommend

- ◆ Public/Private partnerships are critical
 - ◆ Public good must be met
 - ◆ Somebody's got to make some money
- ◆ Market readiness critical to success
 - ◆ Tale of the solar water heaters
 - ◆ "Best" is the enemy of "good enough"
- ◆ Education
- ◆ Develop approaches to long-term solution dealing with systems in transition

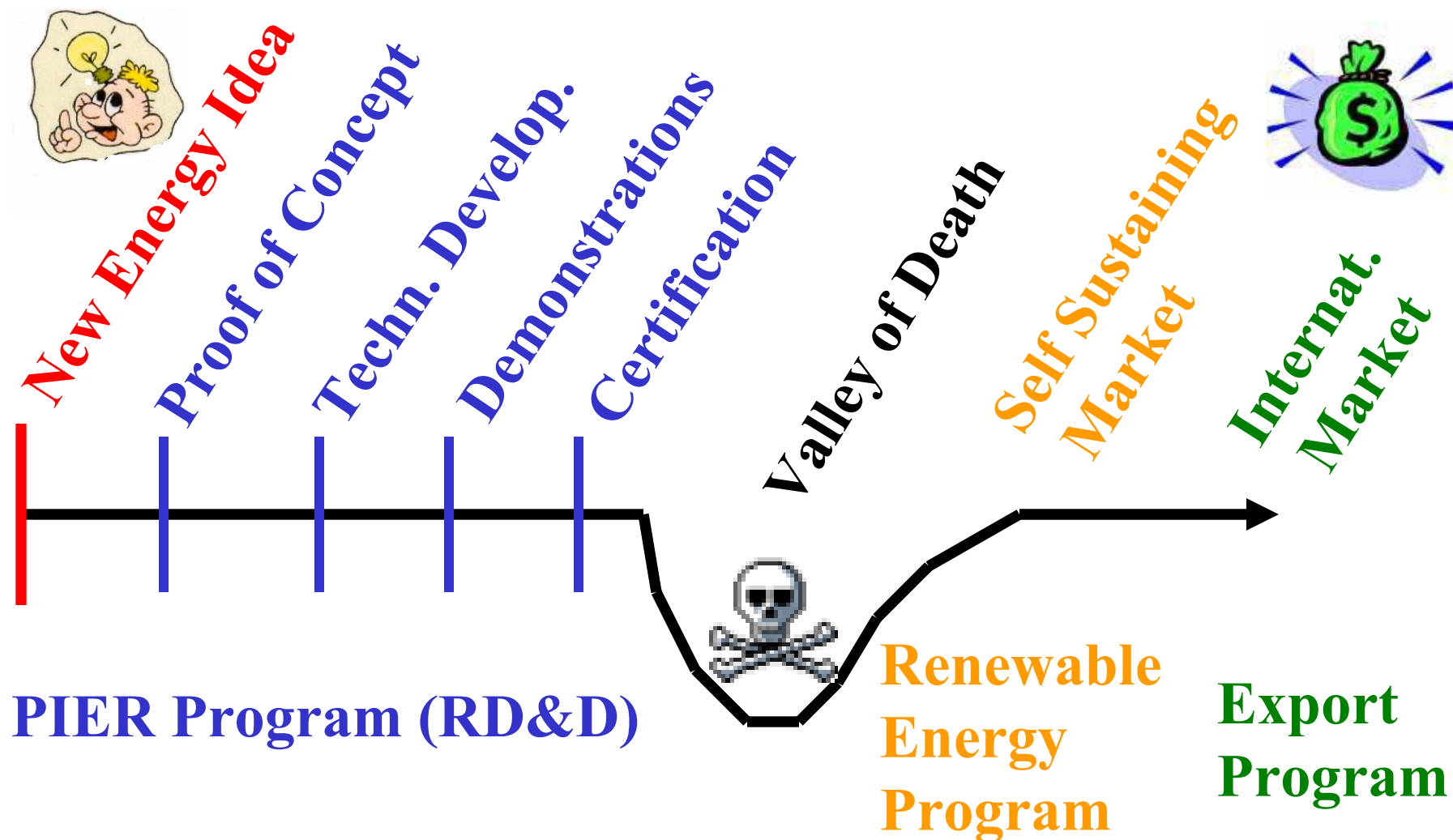


Role of Government

- ◆ Purchasing
- ◆ R&D through the “valley of death”
- ◆ Make use of “bully pulpit” and policy tools
 - ◆ Take advantage of beneficial externalities
 - ◆ Sensibly address competing interests
- ◆ Aggressive standard setting
 - ◆ Uniform approach for interoperability
 - ◆ Expand on Energy Star and NEMA labels

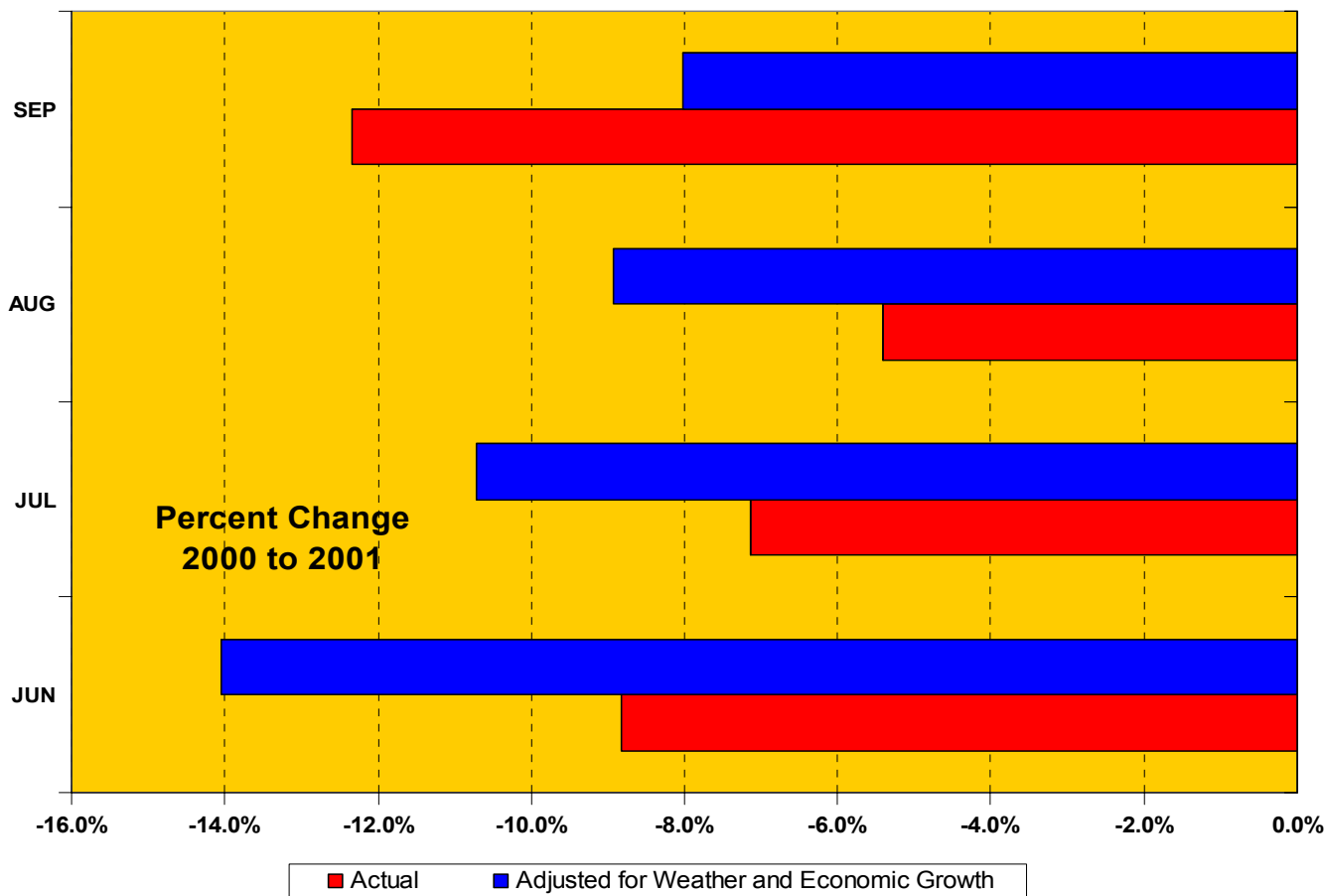


Technology Development Continuum From Innovation to Market



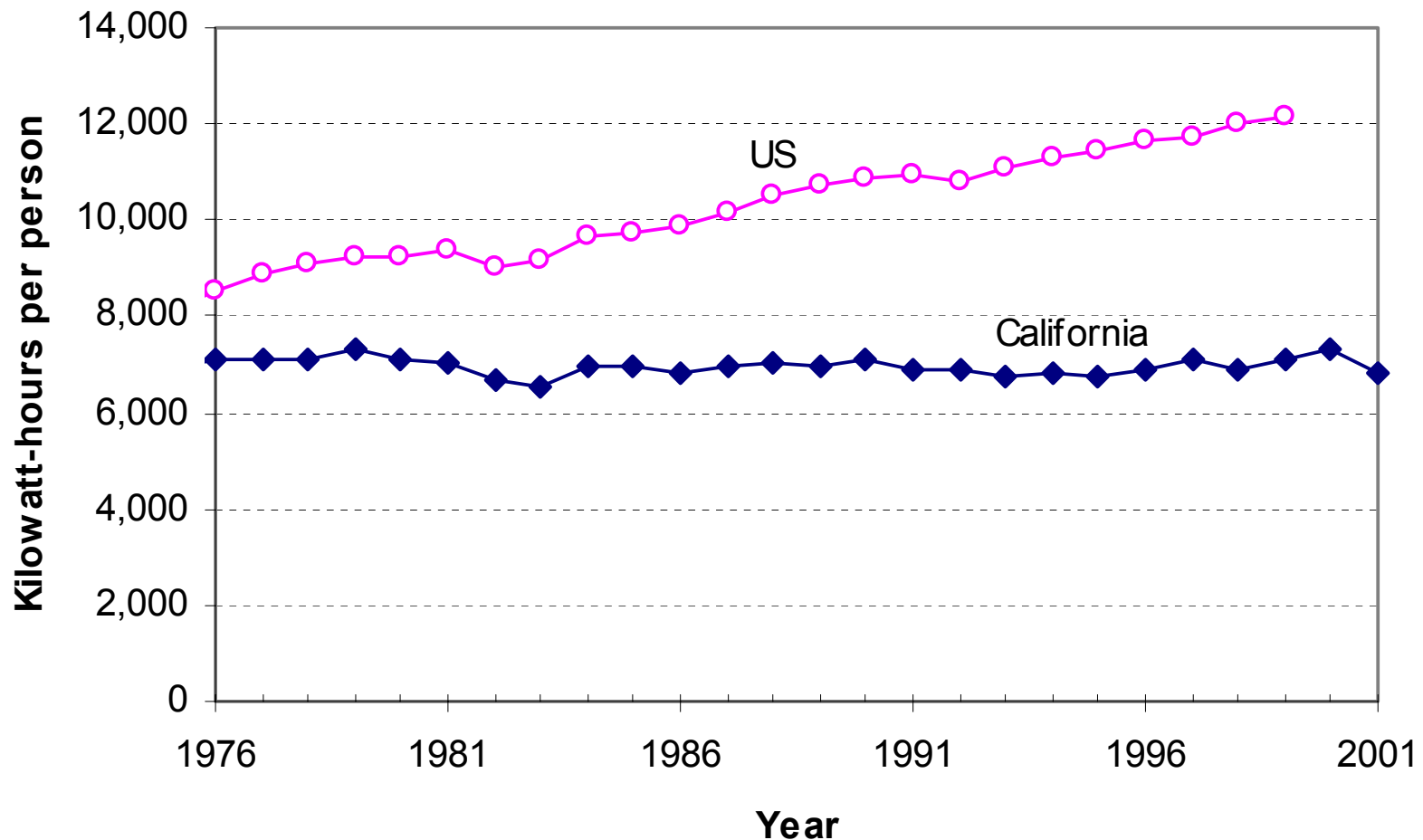


Summer 2001 Peak Demand Reductions





California and United States Electricity per Capita Trends Since 1976



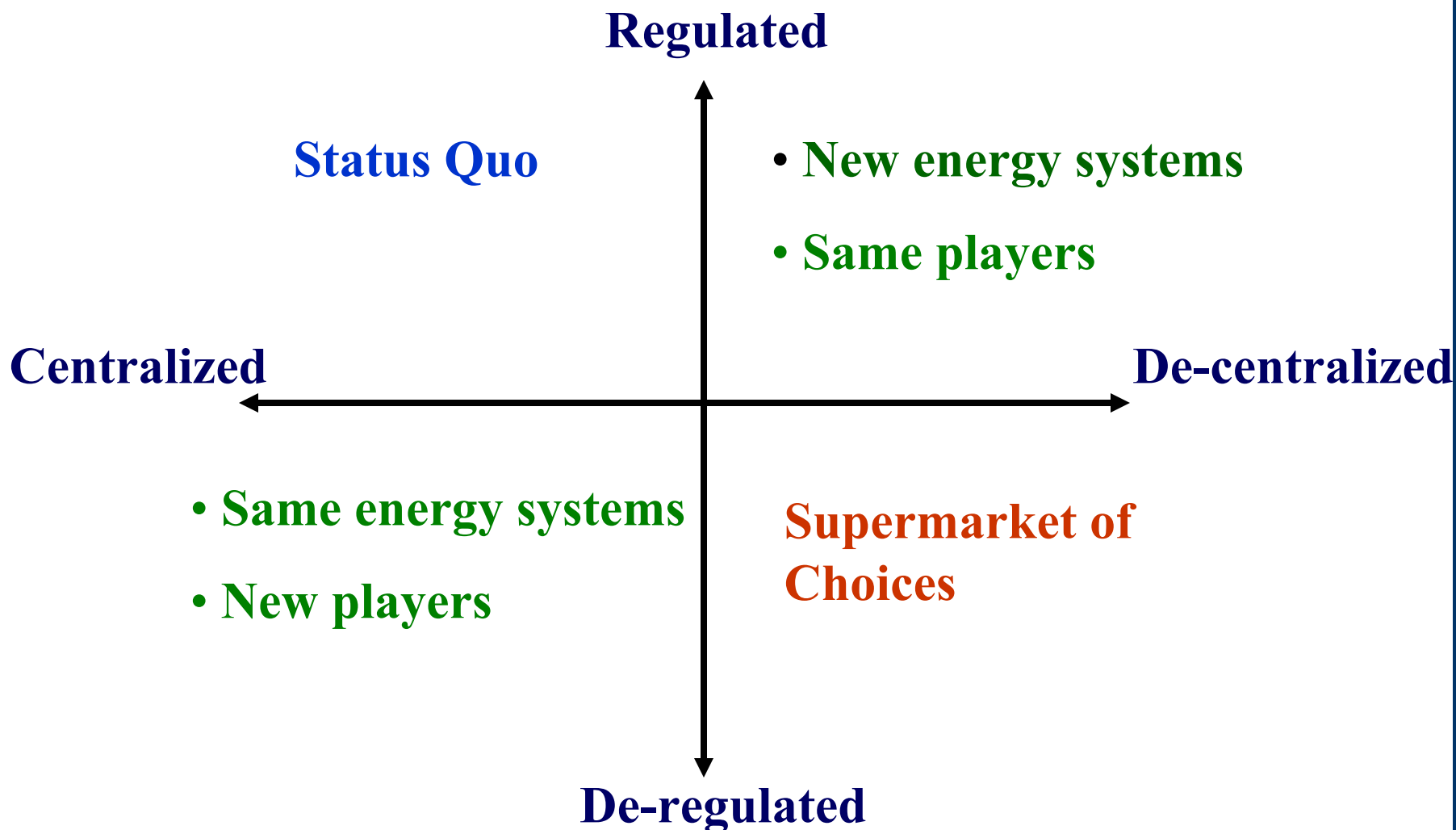


Technology Paths to the Future

- ◆ Public/Private partnerships a must
- ◆ Develop technologies based on life-cycle and systems perspective
- ◆ Maintain a diverse portfolio - the Lone Ranger doesn't live here
- ◆ Incorporate exogenous technologies to improve transparency and lower costs
- ◆ Resolve central station /DG issues



Our R&D Program Must Address Future Market Scenarios





To Push Forward, Government

- ◆ Must take the lead in framing the debate
- ◆ Must provide sustained leadership
 - ◆ Requires a bipartisan approach
- ◆ Can rely on earlier models
 - ◆ Race to the moon
 - ◆ More recent NNSA model



Driving to a Sustainable Future: The “E”s are Linked



- ◆ **Environment**
- ◆ **Energy**
- ◆ **Economics**
- ◆ **Education**

